UNI-T®

Model UT713
OPERATING MANUAL

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Introduction

The UNI-T Model UT713 Thermocouple Calibrator is a precise source and measurement tool for calibrating thermocouple instruments. The calibrator sources or measures mV or 8 different type of TC in units of °C, °F. But the Meter cannot uses as an output source and measurement.

Unpacking Inspection

Open the package case and take out the Meter, check the following items carefully to see any missing or damaged parts:

Item	Description	Qty
1	Operating Manual	1 piece
2	Test Lead	1 pair
3	Alligator Clip	1 pair
4	9V Alkaline Battery (1604A or 6LF22)	1 piece

Safety Information

This Meter complies with the standard CE EN61326.

Use the Meter only as specified in this operating manual, otherwise the protection provided by the Meter may be impaired.

⚠ Warning

To avoid possible electric shock or personal injury:

- **Before using the calibrator inspect the case. Do not use the calibrator if it is damaged or the case (or part of the case) is removed. Look for cracks or missing plastic.**
- **During measurement, do not contact the naked wire, connector, unused terminal or the circuit under test.**
- **Inspect the test leads for damaged insulation or exposed metal. Replace damaged test leads with identical model number or electrical specifications before using the Meter.**
- **When using the test leads, keep your fingers behind the finger guards.**
- **Never apply more than 30V between any two terminals, or between any terminal and earth ground.**

- **Replace the battery as soon as the battery indicator appears. With a low battery, the Meter might produce false readings that can lead to electric shock and personal injury.**
- **The internal circuit of the calibrator shall not be altered at will to avoid damage of the calibrator and any accident**
- **Do not use or store the calibrator in an environment of high temperature, humidity, explosive, inflammable and strong magnetic field. The performance of the Meter may deteriorate after dampened**
- **Under the influence of Radiated, Radio-Frequency Electromagnetic Field phenomenon, the captioned model may malfunction and can self-recover after the test.**
- **When servicing the Meter, use only the same model number or identical electrical specifications replacement part.**
- **Constantly check the battery as it may lead when it has been using for some time, replace the battery as soon as leaking appears. A leaking battery will damage the calibrator.**
- **Take out the battery when not using for a long time.**

Turning the Calibrator On

Press ⏻ to turn the calibrator on and off

Simulating a Thermocouple

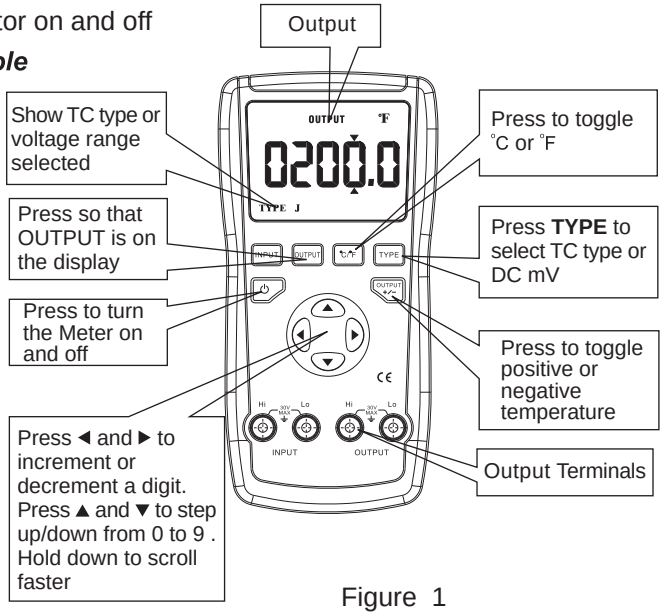

Figure 1

Measuring a Thermocouple

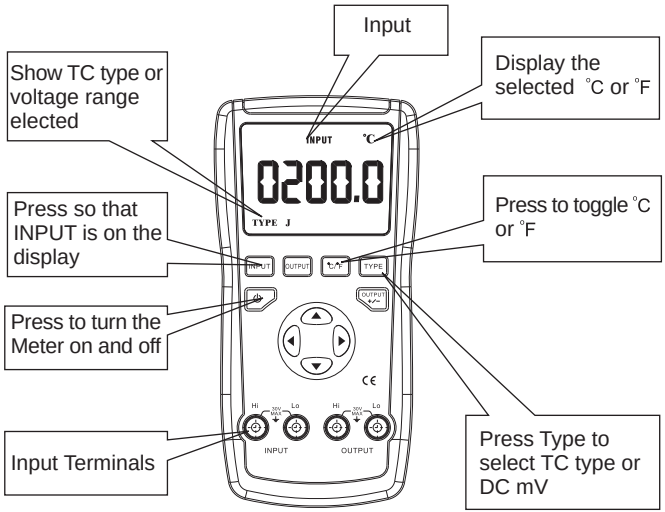

Figure 2

Simulating TC or Source DC mV

1. Press the ⏻ pushbutton to turn the Calibrator on.
2. Press **OUTPUT** to display OUTPUT if the Calibrator is at input mode which displays INPUT.
3. Press TYPE to select the requested TC type or DC mV range.
4. Press ◀ or ▶ to increment or decrement a digit.
5. Press ▲ or ▼ to step up or down from 0 to 9. Hold down to scroll faster.
6. Insert the test leads to the OUPUT terminals as figure 3.
7. Connect the other end of the test leads to the TC measurement equipment or the DC mV measurement equipment.

Note:

- When connecting the calibrator to the auto ranging DC mV measurement equipment or TC measurement equipment, it must lock the range.

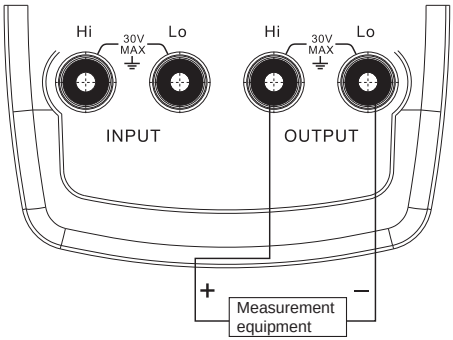
Hi
30V
MAX
Lo
Hi
30V
MAX
Lo
INPUT
OUTPUT
+
−
Measurement
equipment

Figure 3

Measure TC or DC mV

1. Press the ⏻ pushbutton to turn the Calibrator on.
2. Press INPUT to display INPUT if the Calibrator is at output mode which displays OUTPUT.
3. Press TYPE to select the requested TC type or DC mV range.
4. Insert the test leads to the INPUT terminals as figure 4.
5. Connect the other end of the test leads to the TC simulate equipment or the DC mV source equipment.

Note:

- Measuring TC must select the corresponding TC type.
- When measuring DC mV, the input voltage must not exceed the present range of the Calibrator.
- When using the TC cable with standard plug to measure temperature, it is necessary to add an adaptor.

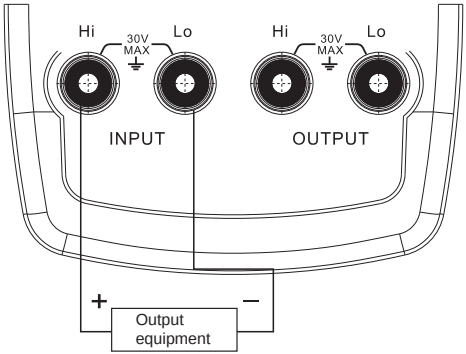

Figure 4

Cold Terminal Temperature Autocompensation

Follow the below procedure to start the cold terminal temperature auto compensation functions:

1. Press the pushbutton to turn the Calibrator on.
2. Press **INPUT** to display enter INPUT mode
3. Press TYPE to select J type.
4. Press and hold TYPE and SHIFT together to display 0 or 1 (display 0 is cold terminal temperature auto compensation, display 1 is the remove cold terminal temperature auto compensation), release the two buttons.
5. Press ▲ and ▼ to adjust the digit to 0, press to confirm.
6. Press pushbutton to turn the Calibrator off.
7. The setting is finished.
8. At that moment
   - At simulate TC mode:
     The calibrator output thermoelectric force = the corresponding thermoelectric force of the set temperature minus the corresponding thermoelectric force of the room temperature.
   - At Measure TC mode:
     The Calibrator display temperature = The corresponding temperature of the Calibrator input terminal thermoelectric force plus room temperature.

Note:

- Because the temperature transducer aluminum plate is put at the back of the Calibrator, try to open the tilt stand if possible when operating the Calibrator.
- Don't touch the aluminum plate when operating the Calibrator to ensure the accurate of compensation temperature.
- If the operating temperature is changed, it is necessary to wait for around 10 minutes to stable the internal transducer before operating the Calibrator.
- Follow the above 1 to 7 steps to remove the cold terminal temperature auto compensation, but change the adjust digit to 1 on step 4.

Explanation of International Symbols

The following symbols are used on the calibrator or in this operating manual. The table below explains their meaning.

International Symbols

Symbol	Meaning
⏚	Grounding
⚠	Warning. Refer to the Operating Manual
⊟	Deficiency of Built-In Battery
⧈	Double Insulated
CE	Conforms to Standards of European Union

Maintenance

⚠ Warning

Make sure the calibrator is off and the test leads are removed from the input terminals and the circuit under test before opening the calibrator's case.

For maintenance procedures not described in this sheet, contact your dealer.

General

- Do not store the Meter in an environment of high temperature, humidity and strong magnetic field.

In Case of Difficulty

- Check the battery and test leads. Replace as necessary.
- Review this instruction manual to make sure you are using the calibrator correctly.

Cleaning

Periodically wipe the case with a damp cloth and detergent;
do not use abrasives or solvents.

Calibration

Periodically wipe the case with a damp cloth and detergent; do not use abrasives or solvents.

Replacing the Battery

- When the symbol appears on the display, replace the battery with a 9V alkaline battery (1604A or 6LF22)
- Remove the battery from the battery door and turn the calibrator off when it is not using for a long time.

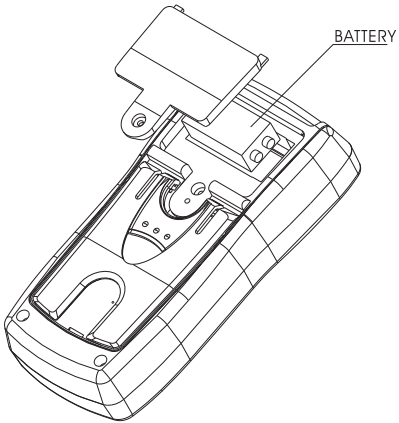

Figure 5

⚠ Warning

To avoid personal injury or damage to the calibrator, use only a 125mA 250V fuse for F1.

In Input mode, the calibrator and TC are reliably connected. When the display continuisly shows OL, the fuses may be blown.

Replace the fuses using the following procedure:

1. Remove the test leads from the calibrator terminals and turn the calibrator off.
2. Remove the screw on the battery door, then remove the battery door and take out the battery.
3. Remove the three screws from the case bottom and turn the case over.
4. Gently remove the fuse from its mounting bracket.
5. Replace the blown fuse with a 125mA 250V fuse.
6. Fit the top and bottom covers together.
7. Reinstall the three screws.
8. Replace the battery door and reinstall the battery door screw.

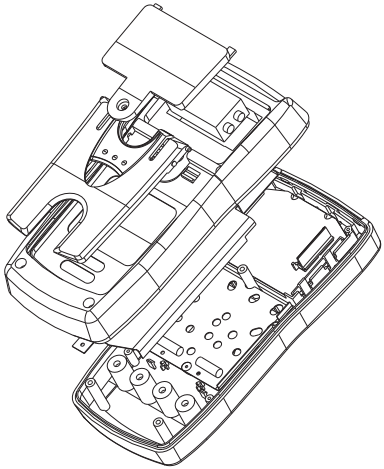

Figure 6

Specifications

Specifications are based on a one year calibration cycle and apply for ambient temperature from +18℃ to +28℃ unless stated otherwise.

Temperature Measure and Thermocouple Simulate

Thermocouple Type	Temperature Ranges	Display Resolution	Accuracy
J	-200.0~1200.0℃	0.1℃ or 0.1℉	±0.04%±1.5℃ (≤ -100℃) ±0.04%±2.7℉ (≤ -148℉) ±0.04%±1℃ (> -100℃) ±0.04%±1.8℉ (> -148℉)
	-328.0~2192.0℉		
K	-200.0~1370.0℃		
	-328.0~2498.0℉		
T	-200.0~400.0℃		
	-328.0~752.0℉		
E	-200.0~950.0℃		
	-328.0~1742.0℉		
N	-200.0~1300.0℃		
	-328.0~2372.0℉		

Thermocouple Type	Temperature Ranges	Display Resolution	Accuracy
R	-20~1750℃	1℃ or 1℉	±0.04%±3℃ (≤ 100℃) ±0.04%±5.4℉ (≤ 212℉) ±0.04%±2℃ (> 100℃) ±0.04%±3.6℉ (> 212℉)
	-4~3182℉		
S	-20~1750℃		
	-4~3182℉		
B	600~1800℃		
	1112~3272℉		

Thermocouple Standards and Scales

Thermocouple Type	Standard	Scales
J, K, T, E, N, R, S, B	NIST-175	ITS-90

Millivolt Measure and Source

Mode	Range	Display Resolution	Accuracy
mV	-10.00~110.00mV	10μV	±0.04%±2 digits
	-110.0~1100.0mV	0.1mV	

General Specifications

- **Resolution:**
  TC: 0.1°C or 0.1°F (J, K, T, E, N); 1°C or 1°F (R, S, B).
  DC mV: 10μV (110mV range); 0.1mV (1100mV range)
- **Cold Junction Error:** ±0.5°C (-0~50°C)
- **Maximum voltage applied between any terminal and earth ground or between any two terminals:** 30V
- **Storage temperature:** -10°C to 55°C
- **Operating temperature:** -0°C to 50°C
- **Operating altitude:** 3000 meters maximum
- **Temperature coefficient:**0.005% x specified range per °C for temperature ranges -0°C to 18°C and 28°C to 50°C.
- **Relative humidity:** ≤95% (0°C~ 30°C), ≤75% (30°C~40°C) and ≤45% (40°C~50°C)
- **Vibration:**Random 2g, 5Hz to 500Hz.
- **Shock:** 1 meter drop test
- **Safety:** CE EN61326
- **Power requirements:** Single 9V alkaline battery (1604A or 6LF22)
- **Size:** 193mm x 96mm x 47mm
- **Weight:** around 0.45kg (including alkaline battery)

* END *

This operating manual is subject to change without notice.

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